

Geolocation and Geofeed Implementation

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What is Geolocation?

- IP geolocation is the mapping of an IP address to a geographic location (using databases and other data sources).

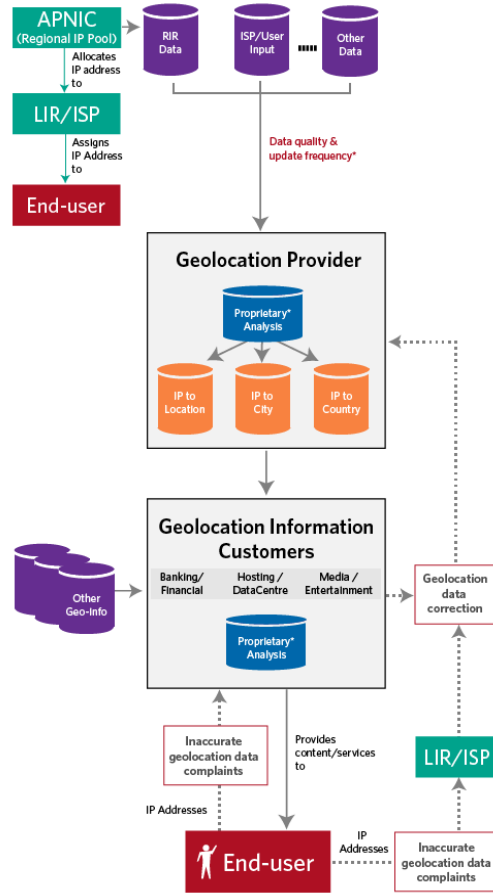


Why do we need Geolocation?

- Location-Based Services
- Targeted Advertising and Marketing
- Enhanced User Experience
- Compliance with Legal and Regulatory Requirements
- Fraud Detection and Prevention
- Emergency Services and Public Safety

Ecosystem

IP Geolocation Ecosystem



* Factors that may contribute to difference in IP based geolocation

IP Geolocation complaints are on the rise

- APNIC has exhausted fresh 103 prefixes from final /8 block.
- New addresses delegated are from recycled pool.
- These IPs were in use before, so some geolocation providers may point to the old geolocation details.

Queries from APNIC members

Currently, we are getting our IP geolocation Australia. Please change our IP geolocation from Australia to Pakistan.

My customers cannot access Bkash, Rocket app with these IPs. Please help.

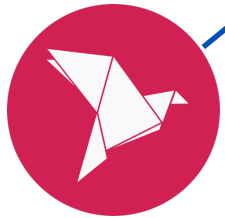
We are getting geolocation issue in our IP. It shows Italy but we serve in Bangladesh. So how can I solve the issue?



We are facing geolocation related issue. A lot of game and services sees us as Hong Kong. Our IP address used to be owned by a Hong Kong based hosting company. Such as PUBG mobile detects the country of our IP as Hong Kong.

Services hosted in amazon web services detects the IP as Hong Kong Country IP. So a lot of our users are not being able to use our country on restricted sites like hoichoi.tv chorki.com etc.

Services Impacted



Fintech services (e.g. Bkash, Rocket) and **Banking websites**



Government websites




Gaming websites (e.g. PubG, CSGO)



Social media and Content Providers

Troubleshooting

- Check APNIC Whois registration is up to date.
- Search on APNIC Whois Database: <https://apnic.net/whois>



```
inetnum:          43.243.204.0 - 43.243.207.255
netname:          BDCOM
descr:            BDCOM Online Limited
country:          BD
org:              ORG-BOL2-AP
admin-c:          BA329-AP
tech-c:           BA329-AP
abuse-c:          AB1190-AP
status:           ALLOCATED PORTABLE
remarks:          -----
remarks:          To report network abuse, please contact mnt-irt
remarks:          For troubleshooting, please contact tech-c and admin-c
remarks:          Report invalid contact via www.apnic.net/invalidcontact
remarks:          -----
mnt-by:           APNIC-HM
mnt-lower:        MAINT-BD-BDCOM
mnt-routes:       MAINT-BD-BDCOM
mnt-irt:          IRT-BDCOM-BD
last-modified:    2024-02-12T08:01:48Z
source:           APNIC
```


Troubleshooting

- Check IP information in third party GEOIP databases (such as, MaxMind, Google) and submit a correction request if the location is incorrect.

GeolIP web services

Enter up to 25 IP addresses separated by spaces or commas

43.243.204.0

View results

IP Address	Location	Network	Postal Code	Approximate Latitude / Longitude*, and Accuracy Radius	ISP / Organization	Domain
43.243.204.0	Dhaka, Dhaka Division, Bangladesh (BD), Asia	43.243.204.0/22	1207	23.7731, 90.3657 (20 km)	BDCOM Online	bdcom.com

Test your IP address

Submit a data correction

* The coordinates are not precise and should not be used to identify a particular street address or household. To better represent a level of accuracy, you must include the Accuracy Radius (km) when displaying latitude and longitude and make it clear that the coordinates refer to a larger geographical area instead of a precise location.

More info: <https://www.apnic.net/geolocation>



Products

Resources

Company

Sign In

Correct a GeolIP Location

GeolIP Data Correction Request

Submit GeolIP Data Corrections

Correct a GeolIP Location

Correct a GeolIP ISP or Organization

Use this form to update the location associated with an IP or IP range.

In some cases, we accept [batch corrections](#) if you have multiple corrections you would like to submit.

Required *

IP range *

Examples:

24.24.24.24

1.2.3.0/24

2001:0DB8::/32

Need to correct your IP address location? Your IP address is

2a09:bac5:173:355::55:28

Country *

Region

City

Postal Code

Email address *

Troubleshooting

- If a geolocation provider has incorrect location details of your IP address range, contact them and request they update the location of the range.
- Some content delivery networks (CDN) and content providers maintain their own IP geolocation database which may or may not use RIR data. You may want to contact them directly to report any geolocation issues.
- Contact web admins of blocked websites directly and inquire about the issue.

APNIC Data




- For records maintained by APNIC, the economy where the organization is registered is recorded (with ISO-3166 country codes, e.g PK, AU)
- This information appears in:
 - Public stats file
 - Portable inetnum and inet6num

Public Stats file

apnic	AU	ipv4	1.0.0.0	256	20110811	assigned
apnic	CN	ipv4	1.0.1.0	256	20110414	allocated
apnic	CN	ipv4	1.0.2.0	512	20110414	allocated
apnic	AU	ipv4	1.0.4.0	1024	20110412	allocated
apnic	CN	ipv4	1.0.8.0	2048	20110412	allocated
apnic	JP	ipv4	1.0.16.0	4096	20110412	allocated
apnic	CN	ipv4	1.0.32.0	8192	20110412	allocated
apnic	JP	ipv4	1.0.64.0	16384	20110412	allocated
apnic	TH	ipv4	1.0.128.0	32768	20110408	allocated
apnic	CN	ipv4	1.1.0.0	256	20110414	allocated

<https://ftp.apnic.net/stats/apnic/delegated-apnic-latest>

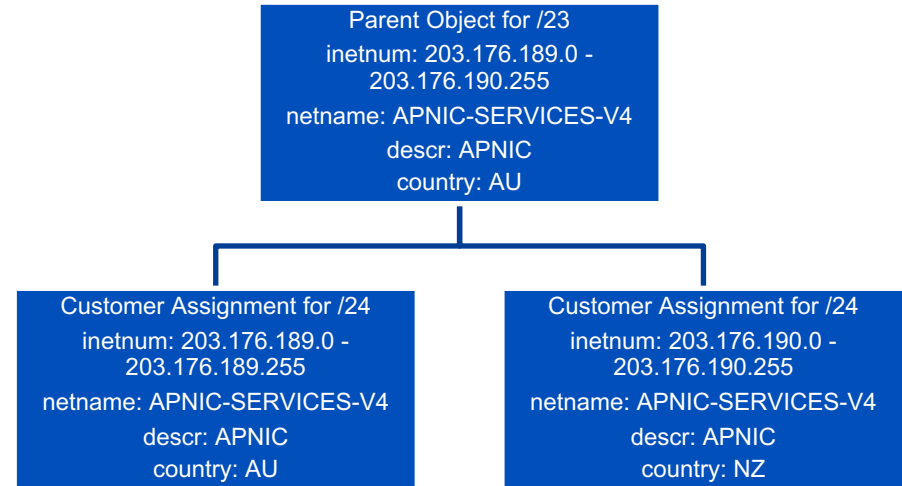
Inetnum/inet6num objects

inetnum:	[mandatory]	[single]
netname:	[mandatory]	[single]
descr:	[mandatory]	[multiple]
 country:	[mandatory]	[multiple]
 geofeed:	[optional]	[single]
 geoloc:	[optional]	[single]
language:	[optional]	[multiple]
org:	[optional]	[single]
admin-c:	[mandatory]	[multiple]
tech-c:	[mandatory]	[multiple]
abuse-c:	[optional]	[single]
status:	[mandatory]	[single]
remarks:	[optional]	[multiple]
notify:	[optional]	[multiple]
mnt-by:	[mandatory]	[multiple]
mnt-lower:	[optional]	[multiple]
mnt-routes:	[optional]	[multiple]
mnt-irt:	[mandatory]	[multiple]
last-modified:	[generated]	[single]
source:	[mandatory]	[single]

Member data

Members can register customer assignments to indicate the location where their network is deployed

- “**country**” attribute in customer assignments can be used to indicate the economy where those IP addresses are used
- “**geoloc**” attribute can be used to associate a latitude/longitude coordinate pair with a particular address block
- “**geofeed**” attribute can be used by entering a URL containing location information in csv format



Inetnum/inet6num objects examples

```
inetnum:          203.176.189.0 - 203.176.189.255
netname:          APNIC-SERVICES-V4
descr:           APNIC (Asia Pacific Network Information Centre)
descr:           Regional Internet Registry
descr:           6 Cordelia St. South Brisbane, QLD
country:         AU
geofeed:         https://geofeeds.packetvis.com/1277c_203.csv
geoloc:          -27.470125 153.021072
admin-c:         AMS345-AP
tech-c:          AHD543-AP
abuse-c:         AM2320-AP
status:          ALLOCATED PORTABLE
remarks:         -----
remarks:         To report network abuse, please contact mnt-irt
remarks:         For troubleshooting, please contact tech-c and admin-c
remarks:         Report invalid contact via www.apnic.net/invalidcontact
remarks:         -----
mnt-by:          MAINT-MYAPNIC-AP
mnt-lower:       MAINT-MYAPNIC-AP
mnt-routes:      MAINT-MYAPNIC-AP
mnt-irt:         IRT-MYAPNIC-TEST-AP
last-modified:   2024-07-10T05:33:33Z
source:          APNIC
```



	A	B	C	D	E	F
1						
2	# Geofeed file managed by PacketVis (https://packetvis.com)					
3	# To report abuses: security@packetvis.com					
4						
5	203.176.189.	AU	AU-QLD	Brisbane	4101	
6						

Geoloc

- A latitude/longitude coordinate indicating where users of this network are located.
- Example:
`geoloc: 33.738045 73.084488`
- Limited success with geoloc (due to specificity/granularity issues, human unfriendly)
- Likely to be deprecated

Geofeed

- RFC 8805 specifies a format for self-publishing geolocation information for IP prefixes.
- Host CSV geofeed file over https and put the URL in the geofeed attribute in the inetnum object.
- Only custodians of IPs with authorised logins/access can add this attribute in the inetnum and inet6num object in MyAPNIC.
- Example: **geofeed: <https://example.com/geofeed.csv>**

	A	B	C	D	E	F
1						
2	# Geofeed file managed by PacketVis (https://packetvis.com)					
3	# To report abuses: security@packetvis.com					
4						
5	203.176.189	AU	AU-QLD	Brisbane	4101	
6						

How to add Geofeed

Step 1: Prepare CSV file with location information and URL

- You can host the CSV geofeed file on your domain.
- Alternatively, use a free service like GitHub or Packetvis (<https://packetvis.com/geofeed/>) to generate the CSV file and url.

Example:

remarks:<https://geofeeds.packetvis.com/example.csv>



	A	B	C	D	E	F
1						
2	# Geofeed file managed by PacketVis (https://packetvis.com)					
3	# To report abuses: security@packetvis.com					
4						
5	203.176.189.AU		AU-QLD	Brisbane	4101	
6						

How to add Geofeed

Step 2: Add geofeed attribute via MyAPNIC

Go to:

- MyAPNIC > Resource Manager > Whois Updates
- Select the “Update” tab
- Search IP prefix to find the inetnum object
- Select 'geofeed' from the drop-down list at the bottom of the page > Add field > Enter the url
- Update















Why Geofeed

- Only custodians of IPs with authorised login/access can add this attribute in the inetnum and inet6num object via MyAPNIC.
- An organization, even big operators can maintain one single CSV file with all their subnets. Any change in geofeed information can be updated in the CSV file.
- The url in the inetnum/ inet6num objects does not need to be changed as the url will still point to the same CSV file with the updated information.

Why Geofeed

- Some geolocation providers have “auto-discovery” which means when geofeed information is entered/updated these providers will automatically extract that information. No need to contact each provider separately.

Adoption

Name	File format ⓘ	Auto-discovery v4 ⓘ	Auto-discovery v6 ⓘ	Reactivity ⓘ	Share
Fastah	✓	✓	✓	1 day	
IP2Location	✓	✓	✓	1 day	
IPInfo.io	✓	✓	✓	1 day	
IPData.co	✓	✓	✓	2 days	
ipapi.co	✓	✓	✓	2 days	
IPRegistry.co	✓	✓	✓	3 days	
BigDataCloud	✓	✓	✓	4 days	
apiip	✓	✓	✓	4 days	
db-ip	✓	✓	✓	9 days	
IPWhois	✓	✓	✓	10 days	
MaxMind	✓	✓	✓	15 days	
IPGeolocation.io	✓	✗	✗	N/A	
WhoisXMLAPI	✓	?	?	N/A	
IPStack.com	?	✗	✗	N/A	

How to verify Geofeed

- After adding the Geofeed attribute, you can verify the information on Geolocatemuch: <https://geolocatemuch.com/?resource>

Test your Geofeed

If you type an IP or a prefix, you can check if it is covered by a geofeed file and if the file is correct.

Inetnum with geofeed found:

```
inetnum:                203.176.189.0 - 203.176.189.255
netname:                APNIC-SERVICES-V4
descr:                 APNIC (Asia Pacific Network Information Centre)
descr:                 Regional Internet Registry
descr:                 6 Cordelia St. South Brisbane, QLD
geofeed:               https://geofeeds.packetvis.com/1277c_203.csv
mnt-by:                MAINT-MYAPNIC-AP
inetnum:                203.176.189.0 - 203.176.189.255
netname:                APNIC-SERVICES-V4
descr:                 APNIC (Asia Pacific Network Information Centre)
descr:                 Regional Internet Registry
descr:                 6 Cordelia St. South Brisbane, QLD
geofeed:               https://geofeeds.packetvis.com/1277c_203.csv
mnt-by:                MAINT-MYAPNIC-AP
```

Geofeed entries inside the inetnum

Prefix	Country	Region	City
203.176.189.0/24	🇺🇦 AU	🇺🇦 AU-QLD	Brisbane

Note: Allow time for the information to propagate before checking.

Fetching Geofeed Data

RFC9632 outlines how to find geofeed data, including the use of the geofeed attribute in inetnum and inet6num objects, and how to fetch that data from the RIRs.

- Fetch bulk FTP downloads of Whois data from each RIR directly and process them using a script (except for ARIN, which requires AUP-type agreement before access can be granted);
- Use a program like <https://github.com/massimocandela/geofeed-finder>, which fetches data from the previous point and provides simple wrapper functions around that data (including workarounds for fetching the ARIN data); or
- Fetch a processed bulk geofeed CSV file like:
<https://geolocatemuch.com/geofeeds/validated-all.csv>

At the moment there are 379004 prefixes with geofeeds.

Add yours now!

Talk to the APNIC team at SANOG for support.

THANK YOU